



# ENSO update

Alexandre Peltier – New Caledonia



World Meteorological  
Organisation



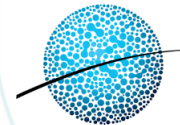
**SPREP**  
Secretariat of the Pacific Regional  
Environment Programme



Pacific  
Community  
Communauté  
du Pacifique



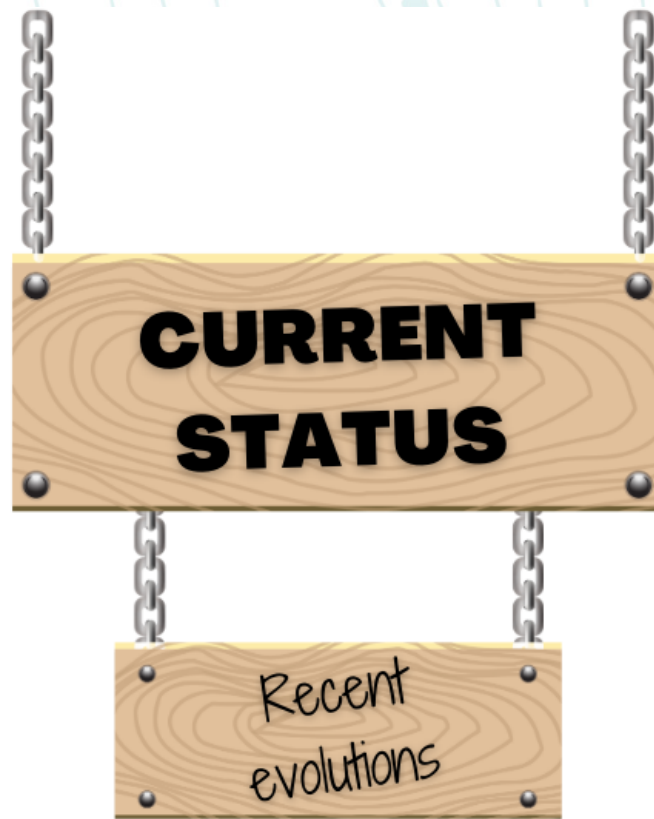
**NIWA**  
Taihoro Nukurangi



**APCC**  
APEC CLIMATE CENTER

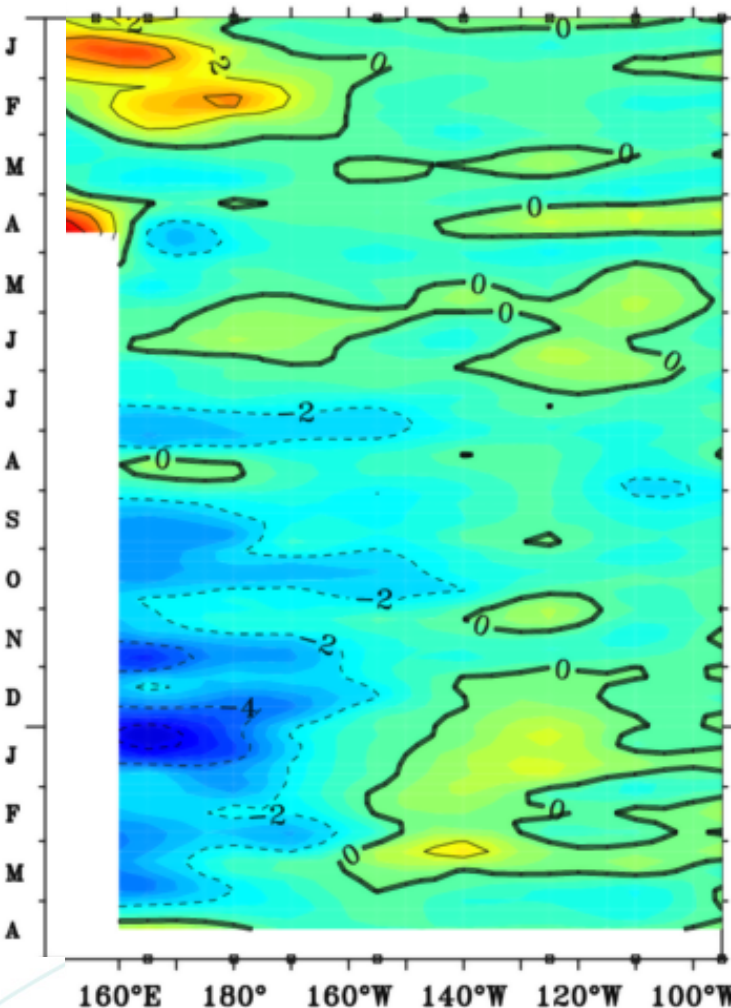


**METEO  
FRANCE**



# Sea Surface Conditions

Zonal Wind Anomalies ( $\text{m s}^{-1}$ )

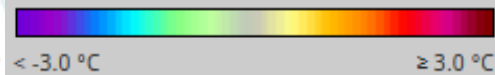


Sea Surface Temperature (L4, MUR25)  
Multi-mission / GHRSSST



In the equatorial Pacific ocean, La Niña peaked in november 2020

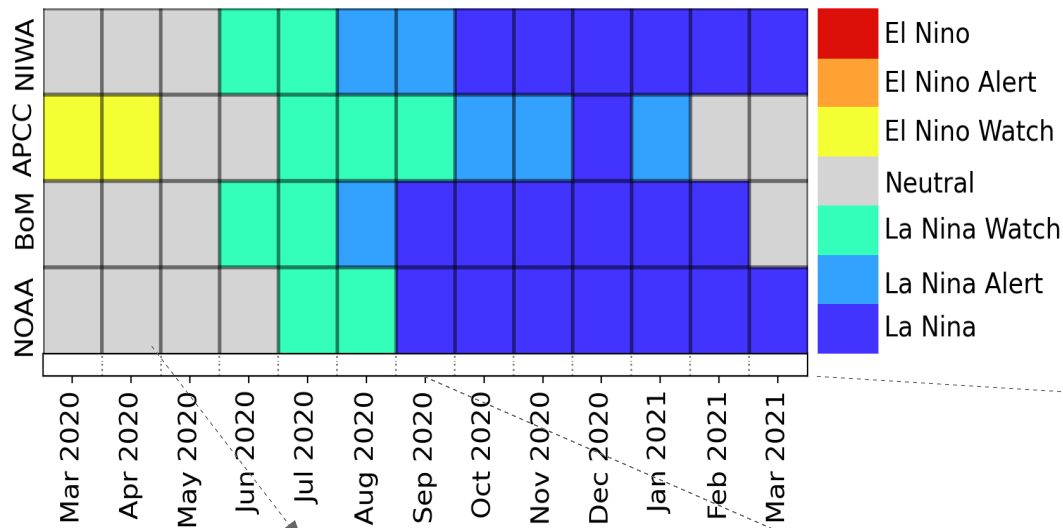
Sea Surface Temperature Anomalies  
(L4, MUR25)  
Multi-mission / GHRSSST



Niño 3.4 anomaly =  $-1,4^{\circ}\text{C}$

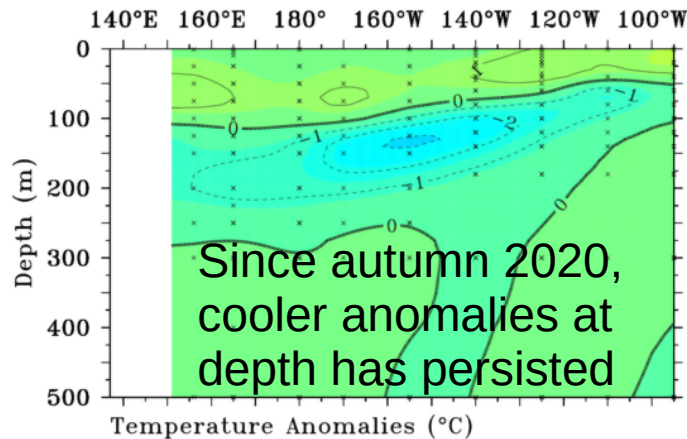


## Pacific Regional Climate Centre ENSO tracker

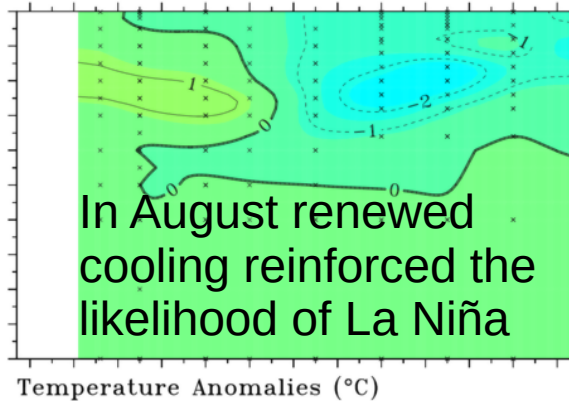


# Subsurface temperatures

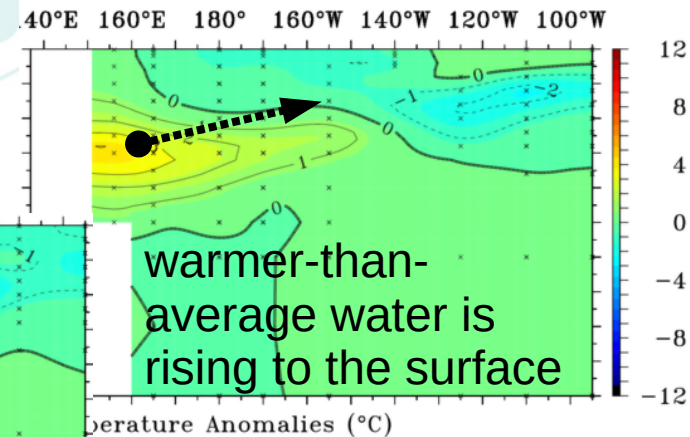
**April 2020**



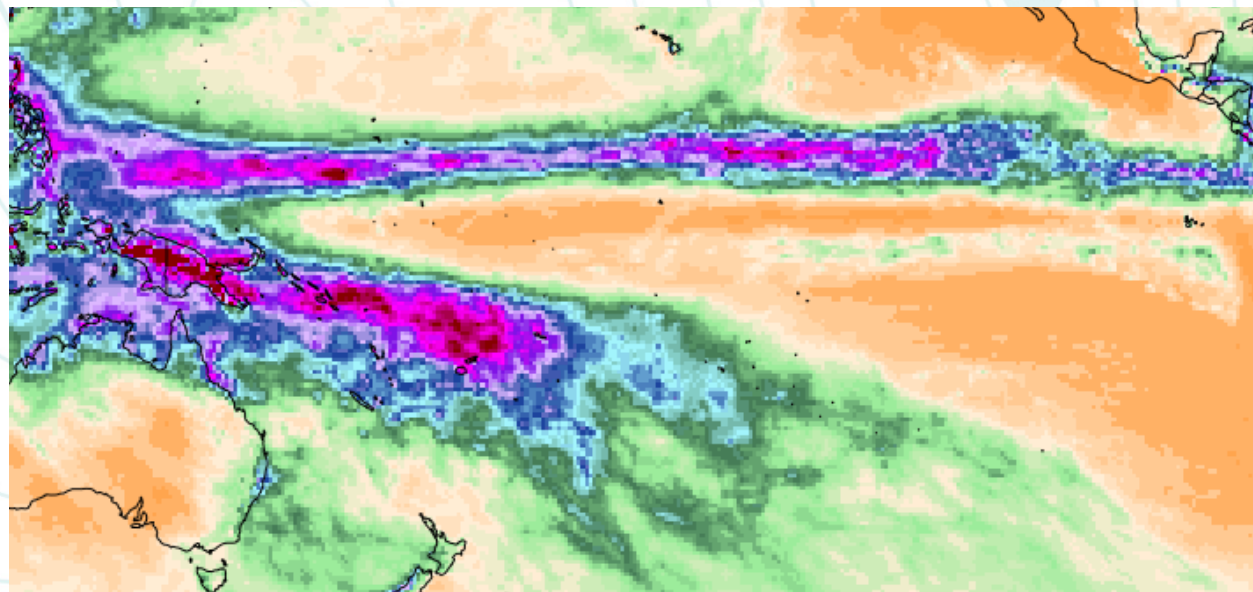
**September 2020**



**March 2021**

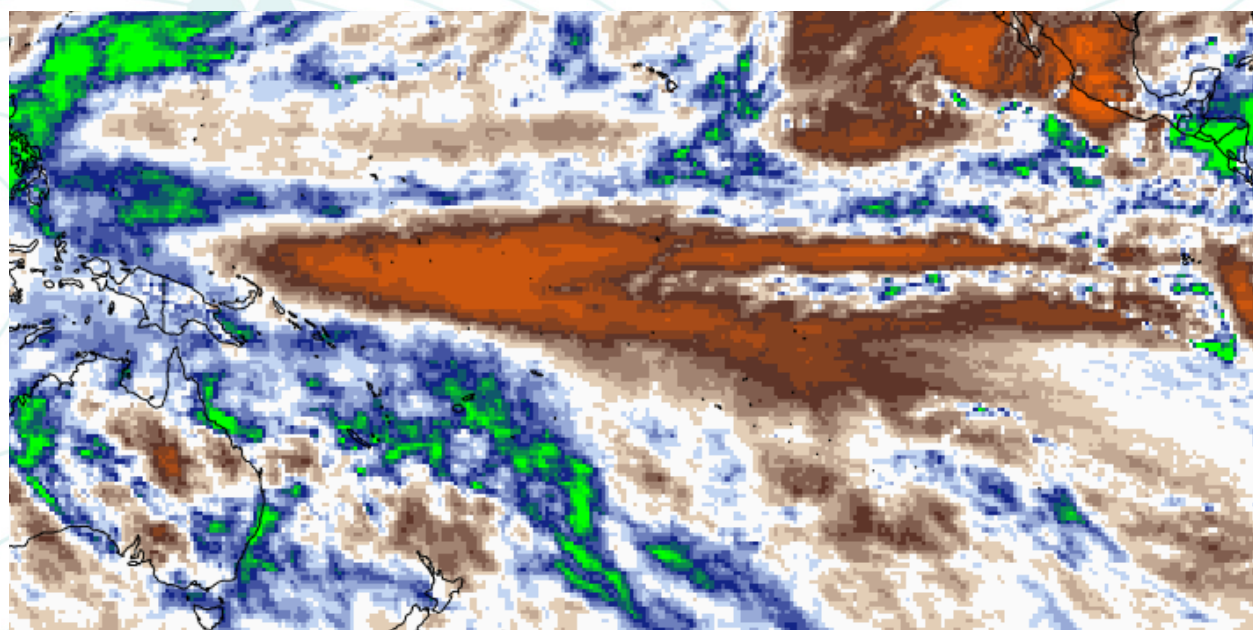


**Recent evolution : a downwelling Kelvin wave is moving from the west to the east under the surface.**



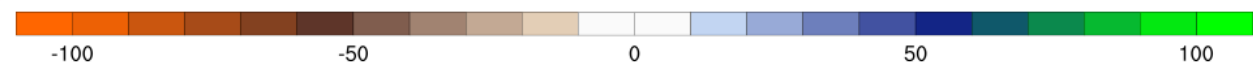
**Acc. Precipitation (m)**  
NDJFM 2021

ECMWF ERA-5



**Acc. Precipitation Anomaly (%)**  
NDJFM 2021 – 1981-2010

ECMWF ERA-5



*Images from Climate Reanalyzer  
(<https://ClimateReanalyzer.org>), Climate  
Change Institute, University of Maine,  
USA.*

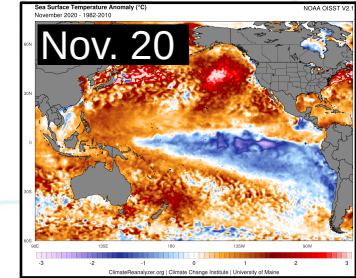
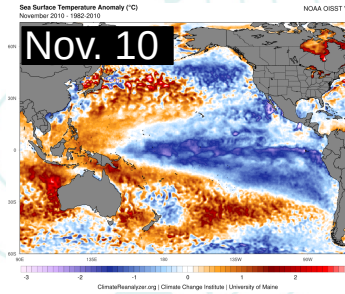
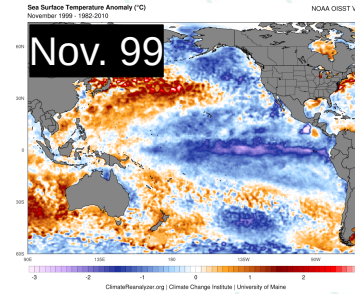
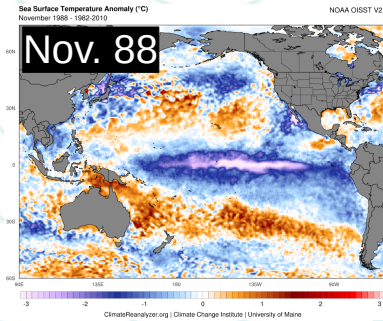
The background of the slide is filled with light blue, wavy, concentric lines that resemble topographical map contour lines. Interspersed among these lines are small, light blue arrows pointing in various directions, suggesting a flow or movement across the space.

**PAST  
EPISODES**

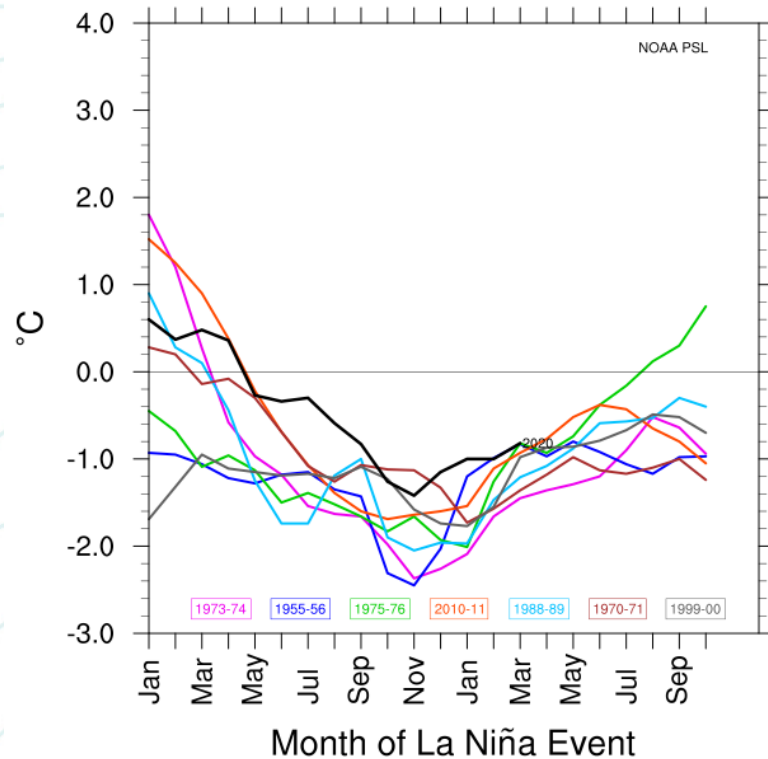




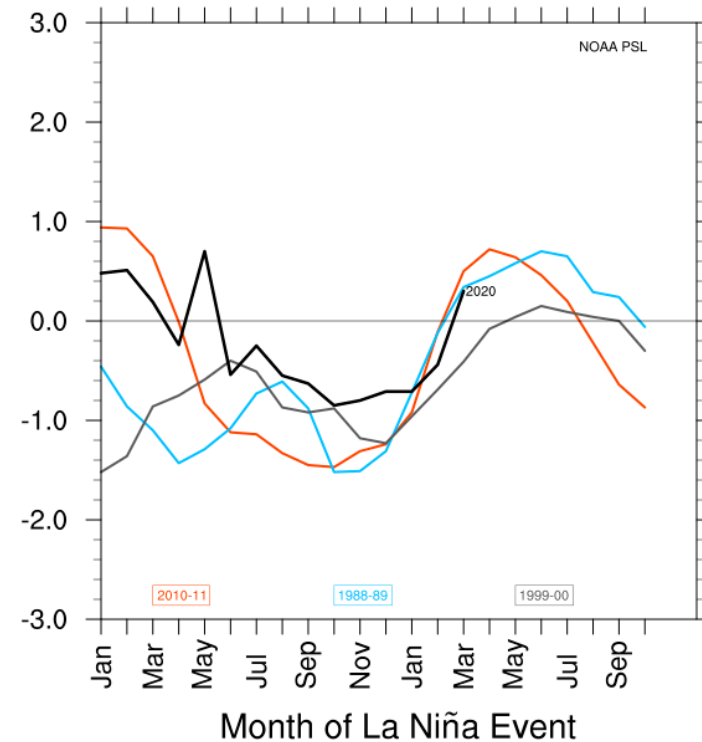
# La Niña Comparisons



Niño 3.4 for the top 7 La Niña events since 1950  
vs. 2020- values



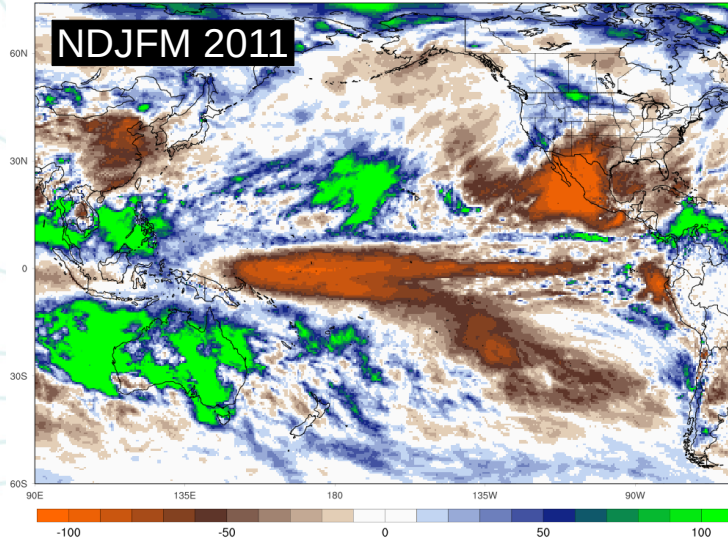
Equatorial Upper 300m T 160E-80W for the top 3 La Niña events since 1979  
vs. 2020- values



# Rainfall anomalies

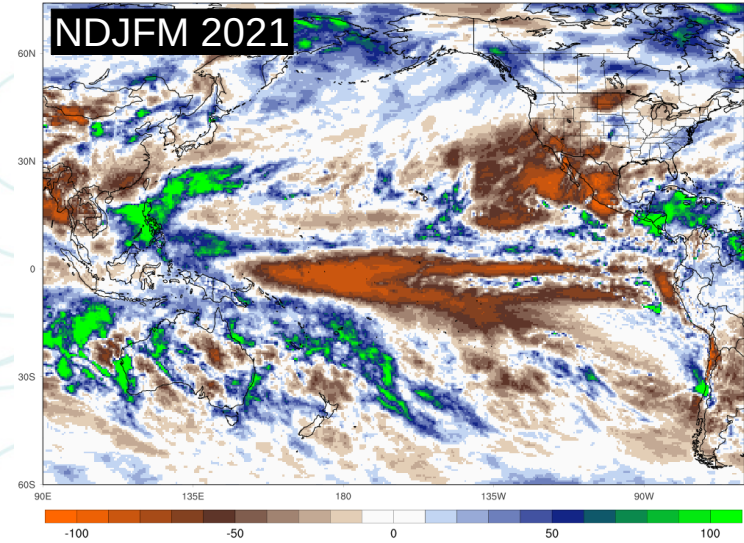
Acc. Precipitation Anomaly (%)  
NDJFM 2011 - 1982-2010

ECMWF ERA5 (0.5x0.5 deg)



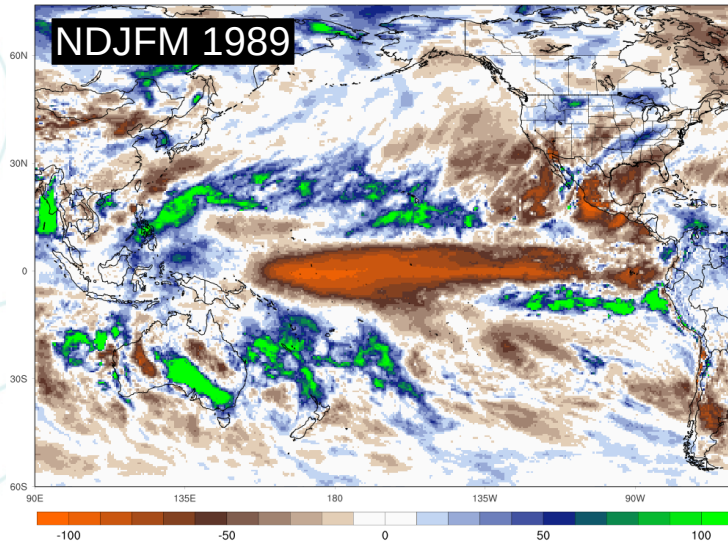
Acc. Precipitation Anomaly (%)  
NDJFM 2021 - 1981-2010

ECMWF ERA5 (0.5x0.5 deg)



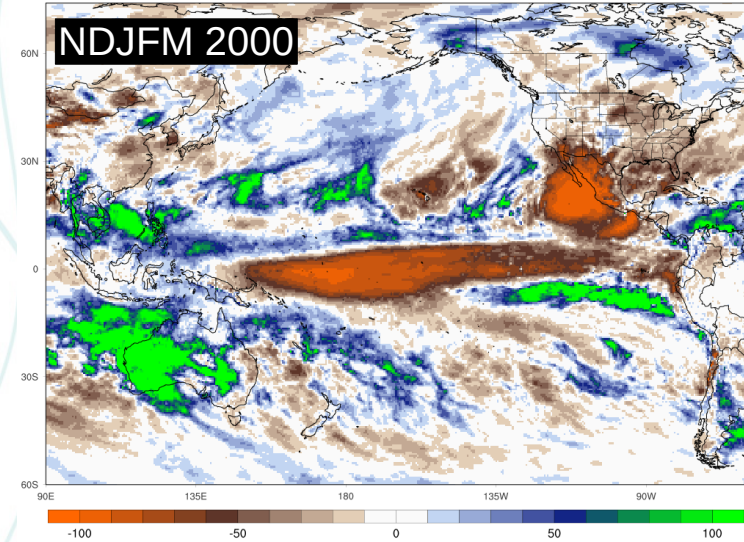
Acc. Precipitation Anomaly (%)  
NDJFM 1989 - 1982-2010

ECMWF ERA5 (0.5x0.5 deg)



Acc. Precipitation Anomaly (%)  
NDJFM 2000 - 1982-2010

ECMWF ERA5 (0.5x0.5 deg)





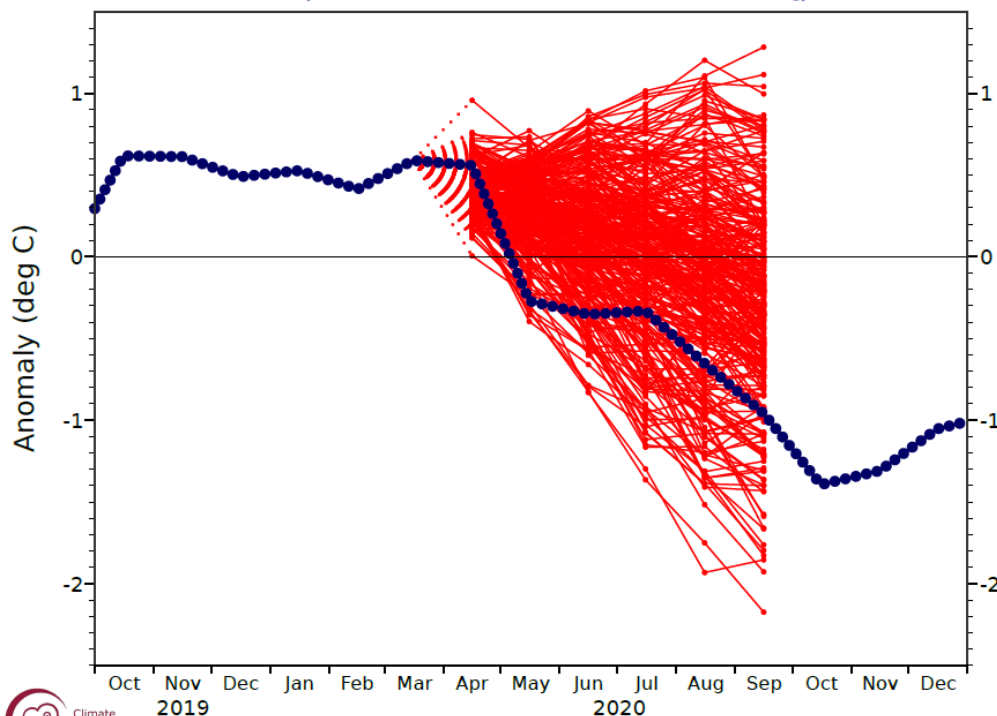


**Multi-system combination SST-index  
forecasts**

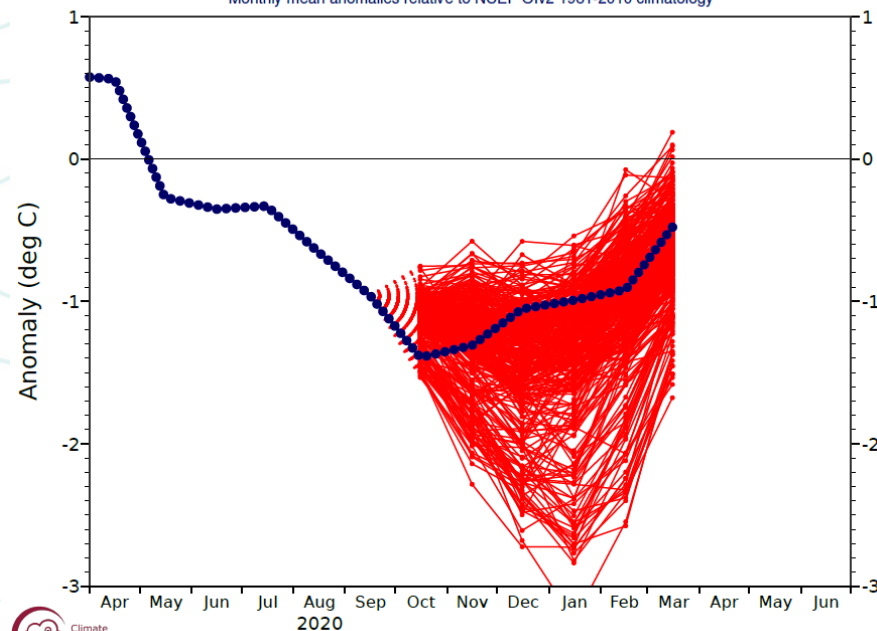
21 April, 2020 :

*PICOF-6 “emphasised that the ENSO forecast beyond May should be used with caution although most models are favouring ENSO neutral conditions”*

NINO3.4 SST anomaly plume  
C3S multi-system forecast from 1 Apr 2020  
ECMWF, Met Office, Météo-France, CMCC, DWD, NCEP  
Monthly mean anomalies relative to NCEP OIv2 1981-2010 climatology

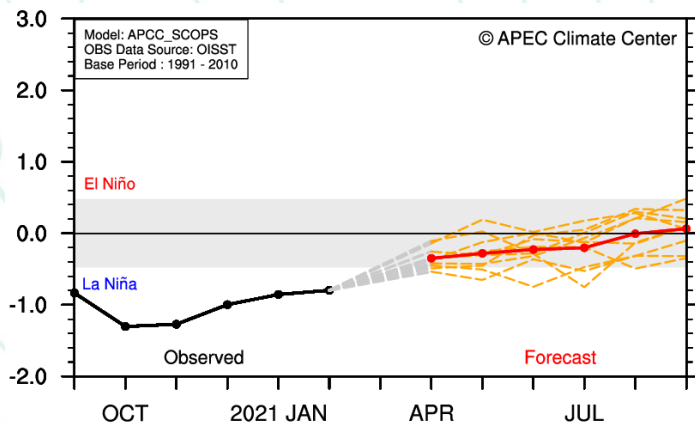


NINO3.4 SST anomaly plume  
C3S multi-system forecast from 1 Oct 2020  
ECMWF, Met Office, Météo-France, CMCC, DWD, NCEP, JMA  
Monthly mean anomalies relative to NCEP OIv2 1981-2010 climatology



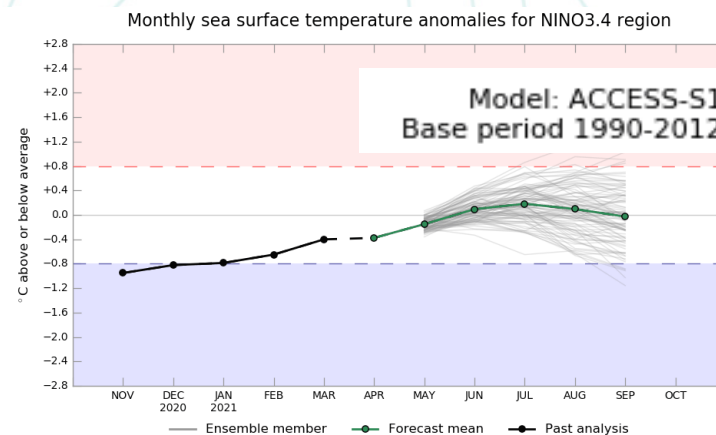
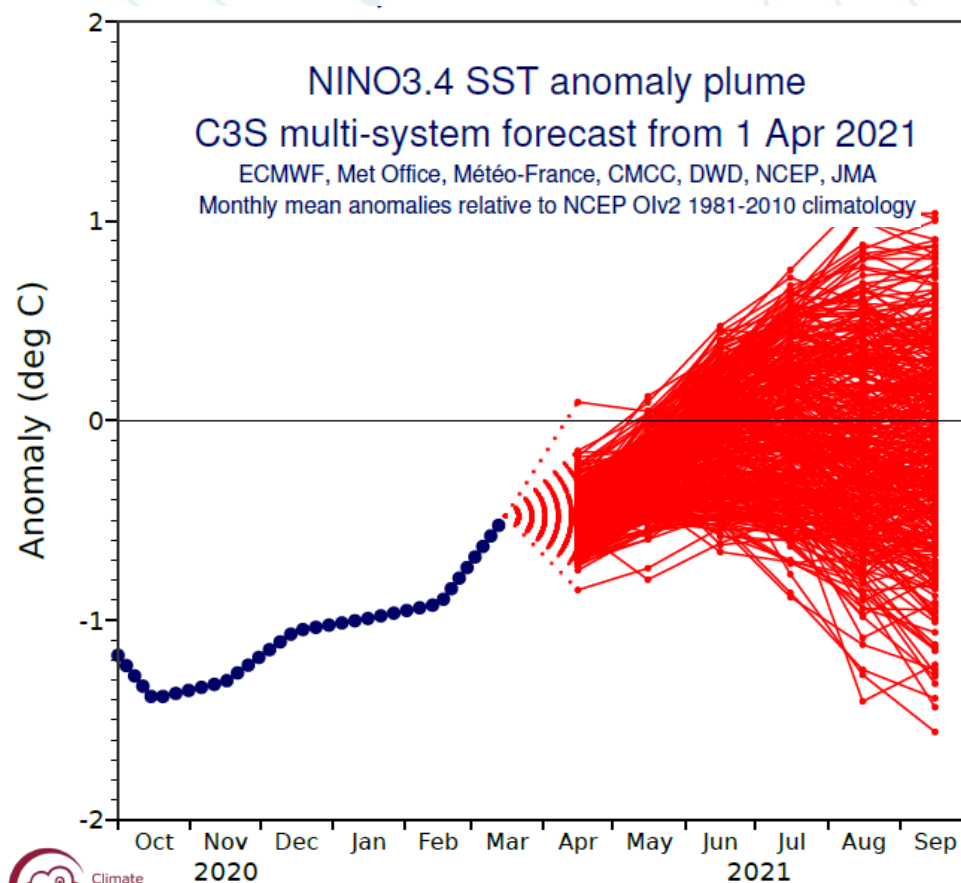
23 October, 2020 :

*PICOF-7 “noted the likely building of La Niña until December/January (ACCESS-S forecast) where it may reach **moderate to strong** La Niña event and continuation until at least early 2021”*



## Probabilities for NINO3.4 percentile categories - Sep 2021

	<P25	P25-P75	>P75
NCEP	35	65	0
MF	45	55	0
UK	5	85	10
JMA	20	80	0
ECMWF	10	90	0
DWD	20	80	0
CMCC	0	75	25
BOM	5	90	5
APCC	0	100	0



Model run: 10 Apr 2021



- The development of a typical El Niño
  - precursor : prior to austral autumn, a charged western tropical pacific heat content is necessary
  - trigger : Westerly Wind Events (WWE) activity in autumn and early winter is a key trigger mechanism (not predictable beyond 10 days)
- Historically :
  - Most El Niño events last a few seasons and then quickly transition into La Niña. In contrast, one out of two observed La Niña events last 2 years or longer
  - very few La Niña events transition directly into El Niño. Instead, most La Niña events slowly decay, taking several years of near-neutral conditions until the next El Niño event is triggered

# La Niña

*SHOULD I STAY OR SHOULD I GO*

